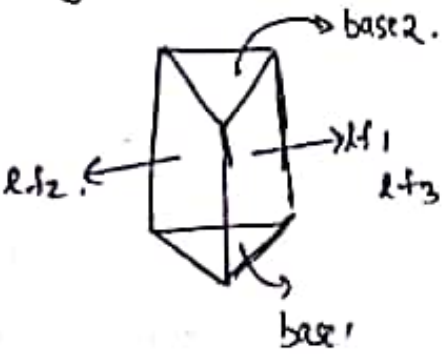
Mensuration

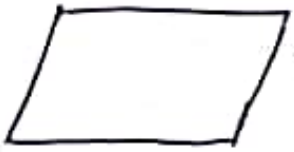
Solid → A object having length, breath, height (thickness) is called solid.

Side portions of solid called lateral surfaces.

Prism: A solid having two concurrent & parallel faces called bases, and other lateral faces called are parallelogram. formed by joing vertices of bases.



lf1, lf2, lf3 → parallelogram



Right prism: lateral faces are Rectangles.
base is ⊥ las to lateral edge.
bases of same shape

→ No of lateral surfaces of right prism = No of sides of bases of prism

→ Total no of surfaces of prism = No of lateral surfaces, +2 (Top & bottom are also surfaces)

= No of sides of prism +2.

* lateral surface = side of base No.

Total S.S = No of lateral surfaces +2.

Lateral surface area

$= lh + lh + bh + bh = 2(lh + bh) = 2h(l+b)$

$= 2h(l+b)$

↳ cost of whitewash, wrapping paper, canvas fixing.

Total surface area

= All surface area (6 surfaces)

$= 2lh + lh + bh + bh + lb + lb$

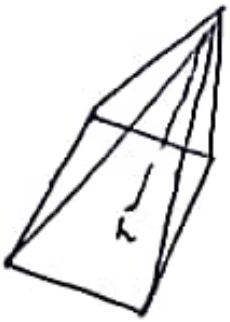
$= 2(lbh + bh + hl)$

Volume $= Ax\,h = (lb)h = lbh$

cube (volume) $= Ax\,h = a^2 \times a = a^3$.

→ Pyramid: solid, which bases are polygon. one end.
other end as vertex.
lateral surfaces are triangle

All triangles meet at common point → vertex.



→ base of regular polygon, foot of ⊥ las from vertex. coincide with. with center of polygon, called right pyramid.

→ length of ⊥ from vertex to any sides of polygon regular called slant height.

Area of triangular face $= \frac{1}{2} \times$ (side of polygon) $\times$ slant height

$(\frac{1}{2}(b) \times$ hight$]$

area of Triangular = $\frac{1}{2}$ x (side) x (slant height)

lateral surface area = $n\left[\frac{1}{2} \times (\text{side polygon}) \times \text{slant height}\right]$

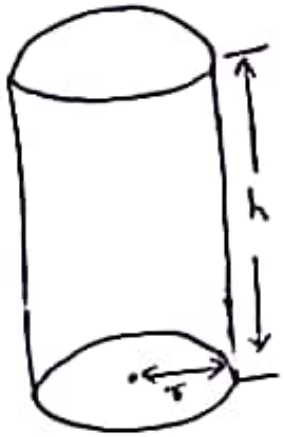
n → no of side of polygon.

= $\frac{1}{2}$ (perimeter of base) x slant height

Total surface area = L.S.A + Area of base

$V = \frac{1}{3} \times (\text{Area of base}) \times (\text{height})$

→ cylinder:



base → circle.

(side → right prism → cylinder.

lateral surface area = p x h

perimeter of base = $2\pi r$ (circle)

Curved surface area = perimeter x height (ph)

$= 2\pi rh$

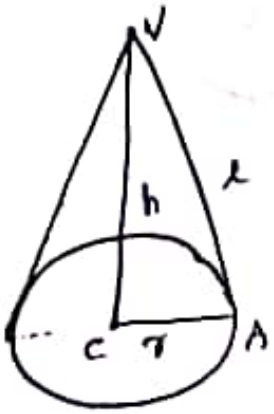
Total S.A = $2\pi rh + \pi r^2$

$= 2\pi r(h + r)$

Volume = (Area of base) x height (Ah)

$= \pi r^2 h$.

cone:



ΔVCA is right angle

$VC \perp AC$

→ $l^2 = h^2 + r^2$

$l = \sqrt{h^2 + r^2}$ → slant height

Cone → has base & top have different shapes.

Cone is not a prism.

Curved surface area = $\pi r l$

$= \pi r(\sqrt{r^2 + h^2})$

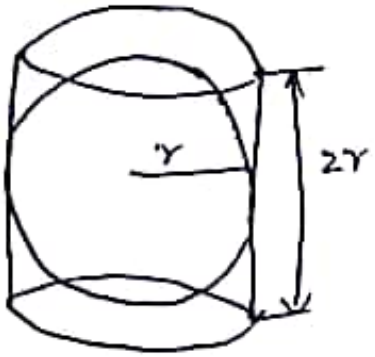
Total S.A = Area of base + L.S.A

$= \pi r l + \pi r^2$

$= \pi r(l + r)$

$V = \frac{1}{3}\pi r^2 h$

→ Sphere:



L.S.A cylinder = cylinder = $2\pi r(h)$

$= 2\pi r(2r)$

$= 4\pi r^2$.

LSA cylinder = Surface area of Sphere

Total surface area = $4\pi r^2$

volume = $4/3\pi r^3$.

hemisphere: lateral surface area = $\frac{1}{2}(4\pi r^2) = 2\pi r^2$.

total surface area = $2\pi r^2 + \pi r^2 = 3\pi r^2$

↓ lateral surface area

→ circle upon Sphere